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Aerospace Industry Trends

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Motivation and Observation

1. Motivation: A window of opportunity exists to influence customers
   - Price competition may force commoditized solutions
   - Increased risk tolerance may enable rapid innovation

2. Observation: Aerospace Industry's customer base is expanding
   - These customers bring new expectations formed by exposure to other industries
   - New & existing customers are shaping each other's expectations – 3 trends

1) Decreased Cycle Times

- 10+ yr dev cycles not preferred
  - Expectation to prototype and iterate
  - Emphasis on “digital engineering” concepts
- Develeopment separated from Integration
  - Internal investments is general purpose tech
  - Customer investments to adapt/modify
- COTS/GOTS back in vogue
  - Perceived to lower risk
  - Perceived to improve interoperability (next)

Top: Alexis Satellite
Middle: LIBS Backpack
Bottom: RAPTOR Telescope

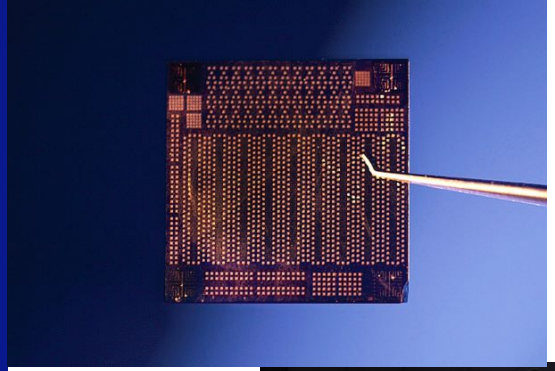
2) Partial/Initial Deliveries

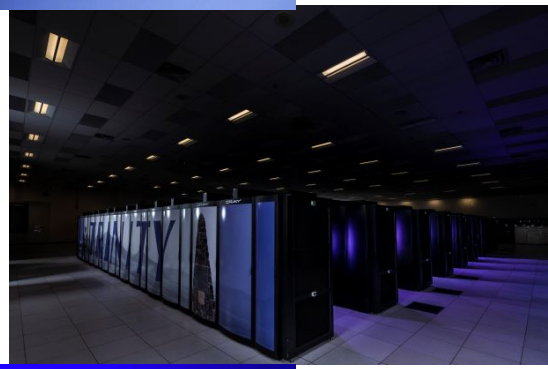
- Early fielding of prototypes
  - Expected to upgrade over time
  - Plan for versioning, esp. software-only
- Interoperability a focus
  - Early releases: interfaces, training, feedback
  - Partial solutions: work within tech ecosystem
- Acceptable terms are customer-specific
  - Rapid (acq, fielding)
  - Minimum Viable Product

Top: LIDAR Demonstrator
Lower Left: Kiwi Nuclear Rocket
Lower Right: GBI Launch

3) Cybersecurity Principles

- Cybersecurity/IA becoming ubiquitous
  - Edge devices (e.g. SCADA)
  - Everything is networked – open architectures
- Still limited cyber expertise across industry
  - Approval process may be long, random
  - Cybersecurity baked in, not “bolted on”
- Threat perception is changing
  - Sophisticated teams, not amateurs
  - Vulnerability through partners





Top: Nanowire Development Tool
Middle: Trinity Supercomputer
Bottom: SuperCam Instrument

Take Aways

1. Changing Aerospace Industry customer expectations are disruptive

2. Customers are open to iteratively improving elements of their system

3. Customers expect to buy adaptation/modification, not innovation

USS Nevada after Crossroads Test